ALICJA BOYD

SCANDIUM

Element Symbol: Sc
Atomic Number: 21

An initiative of IYC 2011 brought to you by the RACI

International Year of CHEMISTRY 2011

raci
Royal Australian Chemical Institute

www.raci.org.au

SCANDIUM

Element symbol: Sc
Atomic number: 21

The name scandium comes from the Latin word Scandia which we now know as Scandinavia.

The element scandium was discovered in Scandinavia in 1870 by the Swedish chemist Lars Fredrik Nilson when scandium oxide was isolated from certain rare earth minerals. It is more abundant in the sun and the stars, and moon rocks collected by Apollo's astronauts were to reveal that scandium is more abundant on the moon, in analyses done at the Australian National University. Historically, the element scandium has been regarded as a geochemical anomaly. Though widely dispersed throughout the earth's crust as a minor, though significant, constituent of a large number of minerals, it is seldom isolated in large concentrations. The only mineral yet discovered containing a large amount of scandium oxide is thortveitite, found in Norway, Madagascar, and USA. More recently, scandium resources are found in China, Kazakhstan, and Russia. Scandium occurs in trace quantities in over 800 minerals.

Scandium and yttrium are conventionally lumped together with the "rare earths" because of similarity of many of their properties with the lanthanides and their rare occurrence in nature in quantity. However, scandium and yttrium are transition elements as seen in the periodic table, and should be treated as such.
The role of the trivalent scandium ion in mineralogical classifications has been examined in detail by Professor Edward Ringwood in the Research School of Earth Sciences, Australian National University.

The Australian Mineral Development Laboratories (AMDEL) discovered a process in 1959 for extracting high grade scandium oxide from waste products from the uranium bearing mineral davidite at Radium Hill. This initiated a systematic investigation of the properties of scandium and its compounds undertaken by Edward Solaga at the ANU. Scandium is extensively used in mercury vapour lamps to project light that is very similar to natural sunlight. These lamps are thus used for camera lighting in the production of movies and television shows.

When alloyed with aluminium, scandium is used in manufacture of ultra light and strong components of bicycle frames, especially in competitive sport. Scandium alloys were also investigated in the Russion aerospace program during the "Cold war". Research in the development of powerful slid-state lasers were given a boost when US President Reagan announced his Star Wars program. Scandium is a component of these complex lasers. It is also used in research in lasers in general, as well as in photonic applications.

In Australia, R&D in partially-stabilized-zirconia for use in fuel cells, as well as components for the motor car industry, has met with a degree of success. Scandium is used as a component in these ventures.

Provided by the element sponsor sponsor Dr Edward Solaga

ARTISTS DESCRIPTION

Scandium was discovered in 1870 by a Swedish chemist Lars Frederik Nilson. It is only found in relatively small quantities in minerals in the Earth's crust but it is more abundant in other parts of the Universe, including the Moon. The name comes from the Latin word Scandia which means Scandinavia. Scandium is used in mercury vapour lamps for camera lighting in V and movie industries. It also has other uses in alloys for making strong components of bicycle frames, car manufacturing and even spacecrafts.

My image is composed using a photograph of a valley and mountains of a region in Sweden, superimposed upon Northern Lights (aurora borealis) in the background, which are characteristic to this part of the World. The colour scheme is representative of the intense red-pink luminescence produced by experiments on compounds of scandium. The theme was suggested by an Australian scientist, Dr Edward Solaga, who has conducted research on high temperature properties of scandium oxide.
The artwork is a limited edition digital print, composed in Photoshop by using layers of image, texture and text.

ALICJA BOYD